TRAVAUX DU MUSÉUM NATIONAL D'HISTOIRE NATURELLE «GRIGORE ANTIPA»

THE JOURNAL OF "GRIGORE ANTIPA" NATIONAL MUSEUM OF NATURAL HISTORY

Travaux du Muséum National d'Histoire Naturelle "Grigore Antipa" 68 (1): 29–36 (2025)
doi: 10.3897/travaux.68.e143434

RESEARCH ARTICLE

A new fossil Cantharidae (Insecta, Coleoptera) from the Miocene deposits of Vlădiceni, Romania

Cosmin-Ovidiu Manci[1], Fabrizio Fanti[2], Viorel Ionesi[3]

1 *"Oceanic-Club" Oceanographic Research and Marine Environment Protection Society, 41 Decebal, 900674 Constanța, Romania*
2 *independent researcher, Tuscany, Italy*
3 *Alexandru Ioan Cuza University of Iaşi, Faculty of Geography and Geology, Department of Geology, B-dul Carol I, no. 11, Iaşi, Romania*

Corresponding author: *Cosmin-Ovidiu Manci* (cosminom@gmail.com)

Received 3 December 2024 | Accepted 29 January 2025 | Published 30 June 2025

Citation: Manci C-O, Fanti F, Ionesi V (2025) A new fossil Cantharidae (Insecta, Coleoptera) from the Miocene deposits of Vlădiceni, Romania. Travaux du Muséum National d'Histoire Naturelle "Grigore Antipa" 68(1): 29–36. https://doi.org/10.3897/travaux.67.e143434

Abstract

A newly discovered species of soldier beetle, *Cantharis* (s. str.) *sesermanae* sp. nov., has been identified from the Sarmatian (around 10.5 mya, Late Miocene) deposits located near Vlădiceni, Iaşi County, Romania. This discovery represents a notable addition to the fossil record, as it is the second species from the family Cantharidae to be described from this particular geological formation. Significantly, it also is the first documented fossil species of the genus *Cantharis* in Romania, highlighting the country's exceptional contribution to the study of ancient biodiversity. This finding provides valuable insights into the biodiversity of Cantharidae during the Miocene. The identification of *Cantharis* (s. str.) *sesermanae* sp. nov. underscores the paleontological importance of the Vlădiceni deposits as a key site for understanding the faunal composition and environmental conditions of the Miocene period. Further research on this and other fossil specimens from the site may offer deeper perspectives on the evolutionary trajectories of Cantharidae and their role within Miocene ecosystems.

Keywords

Compression fossil, *Cantharis*, palaeoentomology, soldier beetle.

Copyright *Manci, Fanti & Ionesi*. This is an open access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

PENSOFT

Introduction

The paleontological site of Vlădiceni, located on Blănarului Hill in Iași, Romania, has gained significant scientific attention in recent years due to its rich fossil deposits. This site, extensively studied in recent publications (Ionesi et al., 2005, 2019, 2020), has yielded an abundance of fossilized insects, particularly those belonging to Coleoptera (some tens) and Hymenoptera present with hundreds of specimens, especially ants (Ionesi et al., 2020; Pintilioaie et al., 2021). Among these findings, in 2021 was described the first fossil species belonging to the family Cantharidae Imhoff, 1856, commonly known as soldier beetles (Pintilioaie et al., 2021). This initial species was assigned to the subfamily Malthininae Kiesenwetter, 1852, a group characterized by slender, soft-bodied beetles with elongated appendages. Building on this first work, the present study introduces a new species of Cantharidae from the site. Unlike the previously described species, the one presented here belongs to the subfamily Cantharinae Imhoff, 1856 in the genus *Cantharis* Linnaeus, 1758.

The genus *Cantharis*, of a Laurasian origin, is currently widespread across the Holarctic realm and extends into the Oriental region. It is particularly well-represented in Europe, where it boasts significant diversity (Delkeskamp 1977; Ramsdale 2002). In Romania, about 22 living species of this genus have been documented (Kazantsev & Brancucci 2007; Macovei 2012), reflecting its notable presence in the country's contemporary beetle fauna. Fossil evidence of the genus *Cantharis* further underscores its long evolutionary history. The genus is well-documented from Baltic and Rovno ambers, where exquisitely preserved specimens provide insights into its morphology and distribution during the Eocene (Fanti 2017; Fanti & Pankowski 2023). Additionally, compression fossils of *Cantharis* have been identified from Oligocene deposits, such as those in Enspel, Germany (Fanti & Poschmann 2019), and Rott, Germany (Heyden & Heyden 1866; Fanti & Walker 2019). From the Miocene, the genus is represented by remarkable compression fossils findings from Radoboj, Croatia (Heer 1847), and Öhningen, Germany (Heer 1847, 1865). These fossil records, spanning diverse geological periods and locations, highlight the genus *Cantharis* extensive temporal and geographical range.

Materials and methods

The specimen described in this study was collected by the third author and their team during field research campaigns conducted in October 2023. It is now securely housed in the Museum of Paleontological Collections, located within the Faculty of Geography and Geology at Iași, Romania. This repository ensures the preservation and accessibility of the holotype for further scientific study. High-quality photographic documentation of the holotype was achieved using a Canon EOS 6D camera equipped with a Canon MP-E 65 mm f/2.8 macro lens. To enhance clarity and detail, the photographs were processed using Zerene Stacker software (version 1.04) for focus

stacking, a technique that combines multiple images to produce an extended depth of field. The resulting images were further refined and enhanced using Adobe Photoshop CS6 to ensure optimal presentation. The specimen's measurements were taken using Stereomicroscop Zeiss Stemi 508 equipped with the Camera Zeiss Axiocam 105 color and ZEN Microscopy Software (version 3.2, blue edition), ensuring precision and accuracy in the morphological analysis. Additionally, a detailed illustration of the specimen was rendered by hand using traditional china ink techniques, preserving the artistic and scientific accuracy of the drawing. This illustration was subsequently digitized and processed with PhotoImpact Viewer SE software to produce a polished and publication-ready representation. This comprehensive approach to documentation and analysis underscores the commitment to scientific rigor and ensures that the specimen is thoroughly described for the benefit of future research.

Taxonomy

Family Cantharidae Imhoff, 1856
Subfamily Cantharinae Imhoff, 1856
Tribe Cantharini Imhoff, 1856
Genus *Cantharis* Linnaeus, 1758
Subgenus *Cantharis* Linnaeus, 1758

***Cantharis* (*Cantharis*) *sesermanae* sp. nov.** (Figs 1–3)

Holotype. Female specimen, compression fossil preserved in laminated, varve-like fine mudstone, originating from sediment layers situated between the *Cryptomactra* Formation and the Bârnova-Muntele Formation. Specimen Code: 8245.

Type locality. Romania: Iaşi county, Blănarului Hill, Vlădiceni, Vlădiceni 1 site (47.134392°N/27.658488°E).

Type horizon. Sarmatian, around 10.5 mya (Copilaș-Ciocianu & Ionesi 2024), Late Miocene. At the base of Bârnova-Muntele Formation.

Etymology. Named in memory of our colleague from the Department of Geology, Anca Maria Seserman, who passed away and did not had anymore the opportunity to study the ichnofossils in the Sarmatian clays of Vlădiceni, same fossil strata. Noun in apposition.

Systematic placement. Knowledge of the geological site and the fauna of Romanian soldier beetles, along with key morphological features such as the size, the rounded pronotal shape, and the slightly bilobed third tarsomere, support the identification of this specimen as belonging to the family Cantharidae and the genus *Cantharis*.

Differential diagnosis. No fossil species of the genus *Cantharis* has previously been recorded from this geological site or from Romania. The only other soldier beetle identified from this location belongs to the subfamily Malthininae and the genus *Malthodes* Kiesenwetter, 1852 (Pintilioaie et al. 2021). The newly described species

Figure 1. *Cantharis* (*Cantharis*) *sesermanae* sp. nov. compression from Vlădiceni (Romania). Holotype (Code 8245), dorsal view, scale bar = 2.0 mm.

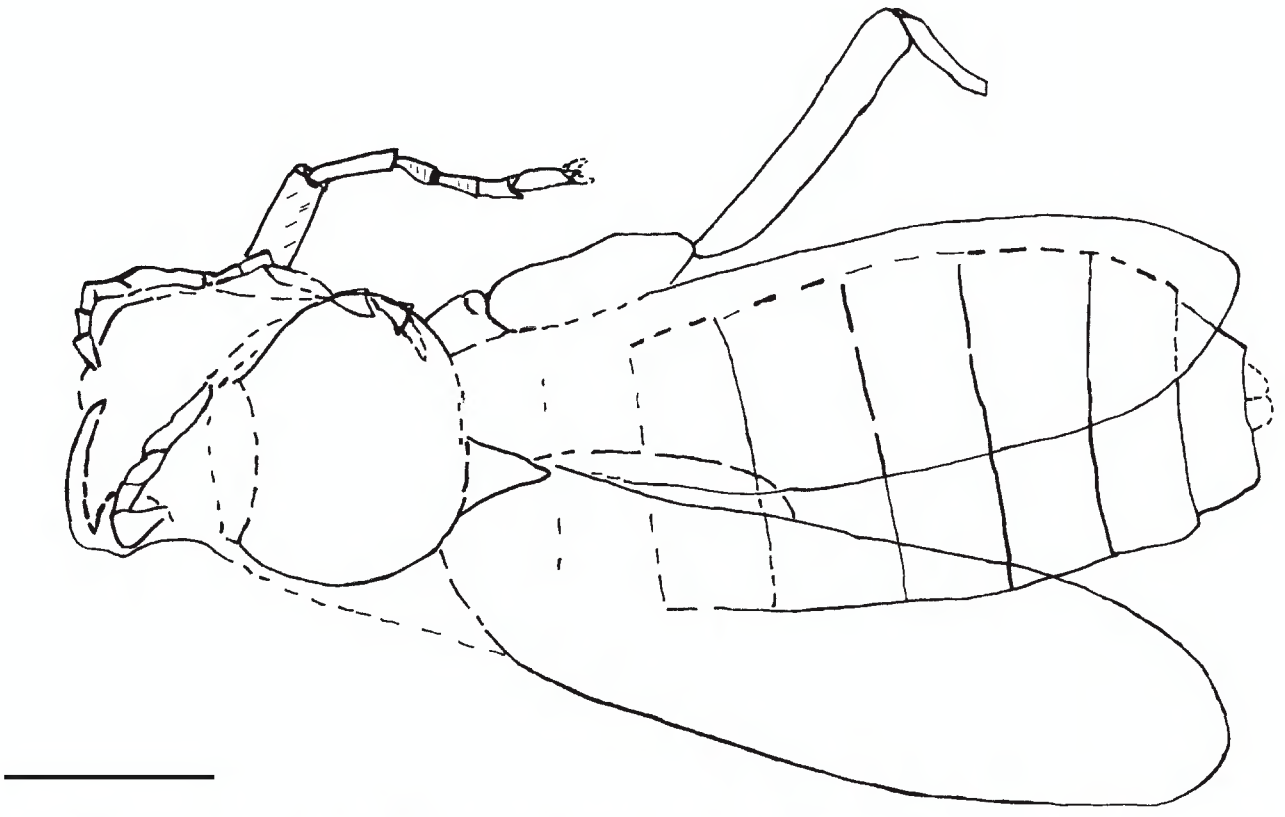

Figure 2. *Cantharis* (*Cantharis*) *sesermanae* sp. nov. compression from Vlădiceni (Romania). Holotype (Code 8245), drawing of *habitus*, scale bar = 2.0 mm.

exhibits remarkable morphological similarity to the extant and widespread *Cantharis livida* Linnaeus, 1758 but differs by having a pronotum more enlarged posteriorly. It can also be distinguished from *Cantharis doernerorum* Fanti & Poschmann, 2019, described from the Oligocene deposits of Enspel (Germany), by its smaller size and by the pronotum narrower anteriorly and wider posteriorly (Fanti & Poschmann 2019).

Description. Adult, winged female, identified by its short antennae and robust abdominal segments, with a wide last tergite and a last sternite bearing apical appendages. Body length: approximately 11.5 mm.

Head almost completely exposed, strongly transverse and wide. Eyes rounded. Mandibles very robust and very long, falciform, seemingly without tooth. Maxillary and labial palps not visible. Antennae filiform, 11-segmented, rather short, reaching the humeri; antennomere I elongate, stout, club-shaped; antennomere II short, robust; antennomere III elongated; antennomeres IV–XI filiform, elongated, slightly visible or partially deformed (antennomeres IX–X subequal, robust). Pronotum about as wide as or slightly wider than head, transverse, strongly rounded (and slightly protruding in the middle) at sides, enlarged posteriorly and tapered anteriorly, anterior and posterior margins very slightly irregular (not well visible) and slightly bordered, corners strongly rounded, surface flat. Scutellar shield elongated, triangular, pointed apically. Elytra smooth, elongated, covering all abdominal segments, approximately

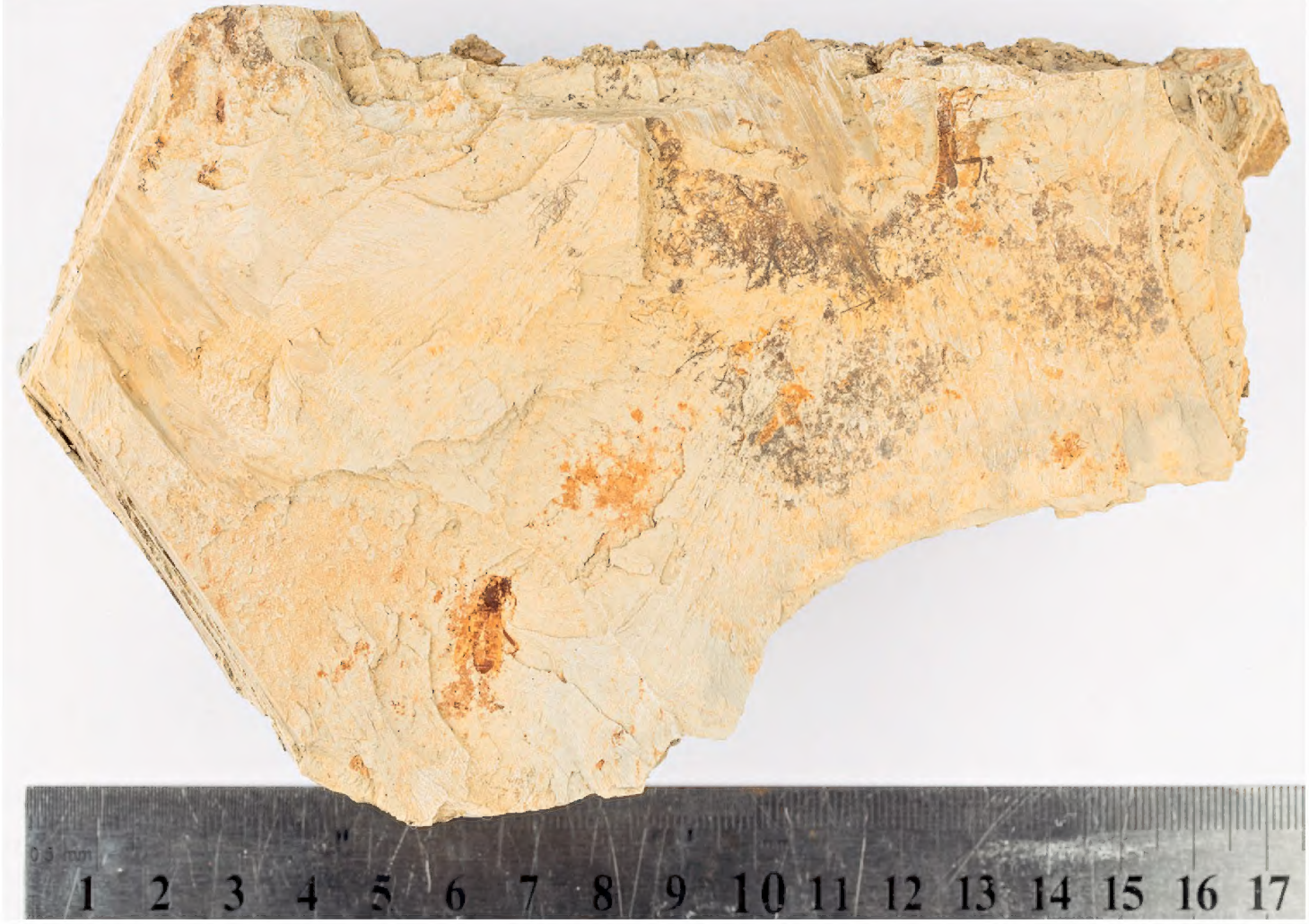

Figure 3. *Cantharis* (*Cantharis*) *sesermanae* sp. nov. compression from Vlădiceni (Romania). Holotype (Code 8245), picture of the entire rock with the holotype and other arthropod.

as wide as pronotum or slightly wider, robust, parallel-sided, rounded at apex. Metathoracic wings covered by elytra, except for a very small part near the scutellum and the basal part of elytra. Anterior legs short and robust, median [and posterior ones] very long and robust, all segments equipped with short and scattered setae (well visible on profemur and protarsomeres I–II); procoxa robust; trochanters seemingly rounded; mesofemur enlarged, curved, very robust; tibiae cylindrical and straight, protibiae shorter than profemora, mesotibiae longer than mesofemora [metatibiae longer than metafemora]; protarsomere I robust, not particularly long; protarsomere II just shorter than protarsomere I, with apex slightly enlarged; protarsomere III shorter than second, slightly bilobed at the sides; protarsomere IV elongated, robust, probably bilobed; protarsomere V and claws slightly visible. Abdominal segments robust, very transverse, last tergite narrower than previous one with margin rather straight, last sternite probably with two small and short apical appendages.

Remarks. The specimen is visible in dorsal view but shows significant compression and deformation in the head region. The antennae are partially damaged, with some antennomeres barely visible, crushed, or missing. Two legs are preserved: the right middle leg is incomplete, while the right front leg is fully intact and clearly visible. The rock containing the new species also preserves an unidentified arthropod. The counterpart (countertype) has not been found and was likely not preserved.

Discussion

The presence of the genus *Malthodes* Kiesenwetter, 1852 in the paleontological site suggests that the area surrounding the site was characterized by a forested landscape interspersed with open spaces (Pintilioaie et al. 2021). The anticipated presence of the genus *Cantharis* further reinforces the notion of open and ecotonal zones, as this genus colonizes today this habitat. Some *Cantharis species*, such as *C. livida Linnaeus, 1758,* which seems to be related to the newly described species, have been observed are predators and include in their diet nectar and pollen, especially from Apiaceae (Fiori 1949; Goidanich 1954; Macovei 2013; Pelletier & Hébert 2014). This dietary preference highlights the potential presence of flowering plants and a rich ecological system formed by pollinators and their associated prey. However, comprehensive studies focusing on the taphonomic processes and ecological dynamics of the insect assemblage at the site are still needed to understand of the paleoenvironment and the interactions between species. An adequate taxonomic study of the species found and the related comparisons with the ecology of living species is therefore highly desirable.

Acknowledgements

We are very grateful to Matei Cristinel (Iaşi, Romania) for helping the third author during field campaigns. We are also thankful to the anonymous reviewers who improved the manuscript.

References

Copilaş-Ciocianu D, Ionesi V (2024) New Miocene fossil taxa illuminate the evolution andpaleobiogeography of the Ponto-Caspian gammaroid amphipod radiation, Contributions to Zoology 93: 268–288.

Delkeskamp K (1977) Pars 165, Fasc. 1. Editio seconda. Cantharidae. In: Wilcox JA (Ed.) Coleopterorum Catalogus Supplementa. W. Junk, The Hague, 485 pp.

Fanti F (2017) Catalogo Cantharidae fossili del mondo. Fossils & Minerals Review 2: 1–18 / World catalog of fossil Cantharidae. Fossils & Minerals Review 2(Special Issue): 1–52.

Fanti F, Pankowski MG (2023) The first species of Cantharis from Ukrainian Rovno amber (Coleoptera, Cantharidae). Zootaxa 5323(2): 293–297.

Fanti F, Poschmann M (2019) First soldier beetles (Coleoptera Cantharidae) from the late Oligocene Enspel Fossil-Lagerstätte (SW Germany). Palaeoentomology 2(4): 363–371.

Fanti F, Walker LJ (2019) Fossil soldier beetles (Coleoptera: Cantharidae) of the Georg Statz Collection from the Oligocene Rott Formation, Germany. Palaeoentomology 2(5): 491–504.

Fiori G (1949) Contributi alla conoscenza morfologica ed etologica dei Coleotteri. IV. *Cantharis livida* Lin. (Cantharidae). Bollettino dell'Istituto di Entomologia dell'Università degli Studi di Bologna 17: 265–274.

Goidanich A (1954) Cantaridi (Cantharidae o Telephoridae) (p. 85). Enciclopedia Agraria Italiana 2 (CAN-CRED), xv + 1178 pp.

Heer O (1847) Die Insektenfauna der Tertiärgebilde von Oeningen und von Radoboj in Croatien. Erste Abtheilung: Käfer. Erster Theil: Käfer. W. Engelmann, Leipzig, 229 pp. + [1] + 8 plates.

Heer O (1865) Die Urwelt der Schweiz. F. Schulthess, Zürich, xxx + 622 pp., 11 plates. [French translation in 1872; English translation in 1876; German reprint in 1883]

Heyden CHG, Heyden LFJD von (1866) Käfer und Polypen aus der Braunkohle des Siebengebirges. Palaeontographica 15: 131–156 (+ p. 157: Dipteren-Larve aus dem Tertiär-Thon von NiederFlörsheim in Rhein-Hessen) + plates 22–24.

Ionesi L, Ionesi B, Roşca V, Lungu A, Ionesi V (2005) Middle and Upper Sarmatian on MoldavianPlatform. Editura Academiei Române, Bucureşti, 558 pp.

Ionesi V, Grădianu I, Copilaș-Ciocianu D, Loghin S, Mare S, Dumitriu S-D, Matei C (2019) New data on the fossil fauna from the *Cryptomactra* Formation reveals unexpected diversity. In: Bucur II, Pleș G, Săsăran E, Mircescu CV (Eds) Twelfth Romanian Symposium on Paleontology, Cluj-Napoca, 19–21 September 2019 (Dedicated to the 100th Anniversary of Romanian University in Cluj-Napoca), Abstracts and Field trip guide, 52–53.

Ionesi V, Miclăuș C, Grădianu I, Pintilioaie A-M, Viciriuc M, Copilaș-Ciocianu D, Baciu D-S, Seserman A, Loghin S, Dumitriu SD, Fusu L, Mare S, Matei C, Neacșu V (2020) An extraordinary bed with fossil insects in the Middle Miocene deposits in Iaşi area (Romania). Sesiunea Ştiinţifica Anuală „Ion Popescu Voiteşti", Rezumate, Departamentul de Geologie al Universităţii Babeş-Bolyai, Cluj-Napoca, 11 decembrie 2020, 36–38.

Kazantsev SV, Brancucci M (2007) Cantharidae. In: Löbl I, Smetana A (Eds), Catalogue of Palaearctic Coleoptera. Vol. 4, Elateroidea, Derodontoidea, Bostrichoidea, Lymexyloidea, Cleroidea, Cucujoidea. Apollo Book, Stenstrup, 234–298.

Macovei E (2012) Lista speciilor de Cantharidae (Ord. Coleoptera) din România. Acta Musei Tutovensis 7: 246–248.

Macovei E (2013) Aspecte de răspândire faunistică şi de ecologie a speciei *Cantharis rustica* Fall. (Coleoptera) în România. Acta Musei Tutovensis 8: 242–245.

Pelletier G, Hébert C (2014) The Cantharidae of Eastern Canada and northeastern United States. Canadian Journal of arthropod identification 25: 1–246.

Pintilioaie A-M, Fanti F, Ionesi V (2021) First finding of a fossilized Cantharidae (Insecta: Coleoptera) from the Middle Miocene deposits in Romania. Travaux du Muséum National d'Histoire Naturelle "Grigore Antipa" 64(1): 73–80.

Ramsdale AS (2002) Family 64. Cantharidae Imhoff 1856. In: Arnett RH Jr, Thomas MC, Skelley PE & Frank J.H. (Eds), American Beetles. Vol. 2. Polyphaga: Scarabaeoidea through Curculionoidea. CRC Press, Boca Raton, Florida, 202–218.